4.0 Interpretation, Risk and Opportunities

The purpose of this Chapter is to synthesize the data provided in Chapter 3 into a "So What?" context and/or suggest opportunities for corrective management.

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The listed opportunities offer the agency the ability to focus on management options, restoration projects, and treatments that will benefit resources. The ability of the agency to consider and then implement any one opportunity will be dependent on funding, manpower, feasibility, etc.

4.1 Forest Vegetation

For forested vegetation the following three criteria were analyzed by covertype;

Susceptibility (inability to resist change under current conditions)
Resiliency (the ability to self-restore)
Risk (the danger to the resource if trend continues).

This interpretation is followed by opportunities, which are management actions that may be taken to reverse or change the current trend.

Spruce/fir

Susceptibility: (Moderate) This covertype's historic ability to resist major changes in structure, density, pattern, and composition was a result of periodic low to mixed severity fire and it's occupancy of cool, moist, high elevation sites. These high elevation sites reduce the chances of ignition and fire spread and intensity under normal climatic conditions. The periodic fires, usually 2 or 3 in a 300 year period between lethal fires, kept densities at a level that limited the ability of the stand to carry a lethal fire. The trend is towards increasing densities, increasing live ladder fuels, and increasing dead fuels. The type is loosing it's ability to experience anything but a lethal fire when ignition does occur.

Resiliency: (Low) The nature of the sites that this type naturally occupies and the need for shade for seedling establishment means that recovery is usually slow. The more severe the disturbance, the longer the time of recovery, because micro sites for tree establishment will be removed, seed sources will be more wide-spread to non-existent, soils could be adversely impacted, and early seral species would be greater competitors. An early seral species often occupies the site for many years prior to establishment of spruce and subalpine fir regeneration.

Risk: (Low) Stands will continue to become more susceptible to stand replacing fire if the trends continue. Individual stands are at high risk to lethal fire and a radical change in structure and

composition, but the low number of scattered stands represented on the landscape and the cool, moist nature of the sites suggests that the risk to this type is low.

Opportunities

Treat stands as opportunities arise to move the structural balance towards PFC goals. Areas identified for treatment should contribute to lessening the threat of large, high intensity fires and post-treatmet densities and compostion should mimic the effects of low to mixed severity fire. Harvesting is possible tool, depending upon access, slope, and soil constraints. Prescribed fire would also be a possible tool if fuel loading and stand densitiy is suitable for mimicing a mixed severity natural fire. Sites, that through soils analysis were historically occupied by aspen or mountain brush, should be considered for conversion back to the seral species.

Aspen

Susceptibility: (High - seral aspen) Seral aspen was maintained by relatively short, mixed severity fires intervals that either prevented conifer succession or continually provided holes in mixed stands so that clones were maintained. Seral aspen does not have any ability to resist succession to shade tolerant conifer.

(Low – long-term persistent aspen) Persistent aspen exists primarily as stringers scattered throughout sagebrush and mountain brush types in the east and south portions of the watershed. These stands are resistant to significant change because they generally do not carry a not fire except during drought years.

Resiliency: (High) Aspen sprouts following a disturbance, making it extremely resilient. This ability is what allowed this type to maintain it's place on the landscape historically, under a more frequent disturbance regime. Sprouting can be adversely impacted by changing soil conditions that occur under prolonged conifer dominance. The more acidic leaching of the soil that occurs, the less sprouting success following disturbance.

Risk: (High - seral aspen) Conifer succession will continue to replace aspen and affect soil properties. Individual clones are at risk of being lost as is the complex historic structure of this type across the landscape due to succession. This type's association with adjacent conifer stands that are increasingly at risk to severe fire events also increases the risk to significant changes, perhaps ultimately in it's favor as it would recover faster than the conifer.

(Low – long-term persistent aspen) With continued grazing removing fine fuels in these and adjacent types, and this types natural lack of fuel build-up, the risk to a major change in structure, composition or pattern is low.

Opportunities

Treat seral aspen stands as opportunities arise. Acres of

aspen/conifer stands and other conifer covertypes should be treated to create a greater extent of aspen to reflect pattern shape and size closer to historical levels. Treatments can be mechanical or prescribed fire and should focus initially on stands experiencing succesion to conifer. Stands of aspen would benefit from a mosaic treatment creating interconnected openings large enough to encourage regeneration and withstand domestic and wildlife grazing pressure. (Bartos and Campbell 1998)

Lodgepole pine

Susceptibility: (moderate) This covertype's historic ability to resist significant changes in structure was a result of one or two low intensity "thinning" fires between lethal events. It's ability to resist changes in composition and pattern is a result of its aggressive seedling establishment and ability to regenerate under exposed seedbed conditions following lethal fire. The current conditions (heavy live and dead fuels) in the mature stands of this type have removed the possibility of a low intensity fire. Increased access and the fire breaks created by past management reduces the susceptibility of the type to one landscape level fire.

Resiliency: (High) Following lethal disturbance, lodgepole pine recovers quickly assuming not all seed bearing trees are lost and that the soil surface has not been burned too intensively. Lodgepole pine is the most tolerant conifer to extremes of temperature and moisture found in recently burned over areas.

Risk: (Moderate) Some diversity in age and pattern from past harvest has diminished the risk to this type. The still high percent of acres in the mature and old categories with continuing succession to subalpine fir and risk of mountain pine beetle mortality puts these stands at moderate risk to significant change in structure and composition.

Opportunities

Regenerate approximately 150 acres over the next decade to put 22% of the acres in seedling/sapling age stands. Approximately 100 acres per decade after that would maintain the age distribution described for reference condition. Treatment units should be designed to reflect the size and shape of historic fires in this type, often entire continuous stands with internal patches left untreated. The regeneration of only 100 acres per decade will mean many stands will succeed to very late seral conditions prior to treatment. Insects, fire, or disease may preempt this expected development. If this occurs, those affected stands should be salvaged and counted towards the decadal accomplishment. Harvest and fire are appropriate tools. Thin and mid seral lodgepole plantations (precommercially) to mimic effects of low intensity fires.

Douglas-fir

Susceptibility: (Moderate) This covertype's historic ability to resist major changes in structure, density, pattern, and composition was a result of periodic low to mixed severity fire. The periodic fires, usually 2 or 3 in a 200-year period between lethal fires, maintained more open stands of thick-barked large trees by consuming litter, small trees, and any accumulated fuels. The trend is

towards increasing densities, decreased stem size, increasing live ladder fuels, and increasing dead fuels. Most stands of this type are too dense to expect a low intensity fire to occur.

Resiliency: (Moderate) Douglas-fir needs for shade for seedling. The more severe the disturbance, the longer the time of recovery, because micro sites for tree establishment will be removed, seed sources will be more wide-spread to non-existent, soils could be adversely impacted, shelter/shade would be lost and early seral species would be greater competitors. An early seral species (mountain brush or even sagebrush) often occupies the site for many years prior to establishment of spruce and subalpine fir regeneration.

Risk: (Moderate) Stands will continue to become more susceptible to stand replacing fire if the trends continue. The extensive, interconnected nature of this type provides an opportunity for a large scale, moderate to high intensity fire. Most stands would retain some seed source following fire.

Opportunities

Where this type is occupying long term conifer sites, treat 5% to 10% of the acres per decade. A combination of harvest and fire would be appropriate depending upon access, soils, and slope contraints. Treatments should produce effects ranging from individual tree mortality to larger clearings reflective of the effects of low and mixed severity natural fires. Understory composition and density should be included in any prescription to reduce the potential for a high intensity fire

Where this type is occupying seral aspen, mountain brush, or sage brush sites, consider conversion back to an aspen dominated forest. Again, mechanical and fire treatments are apropriate tools. The number of acres converted back to aspen will have to be determined on site specific basis, with watershed and soil condition as the driving considerations. If mechanical treatment (harvest is the chosen treatment tool, it may be necessary to follow it with a broadcst burn to increase soil pH and increase organic carbon and available nutrients. (Bartos and Amacher 1998, Cryer and Murray 1992)

Data gaps and additional information needs

- Up-to-date stand exam quality vegetation data.
- Extensive fire history for all vegetation types.

4.1.1 Non-Forest Vegetation

Interpretation of Trend

Rangelands – On-Forest rangelands will continue to increase in brush densities and succession to conifer in the absence of disturbance. Increased brush densities correspond with decreased understory diversity and production. As sagebrush densities exceed 15%, watershed protection

value declines and production for both wildlife and livestock decline. Off-Forest, within big game winter range, brush densities will remain low. Individual plant health and vigor will continue to be compromised by intense browsing.

Noxious Weeds - New infestations are found each year and sources of introductions will continue at present or increased levels. Budget appropriations have steadily increased in the past 5 years in response to the growing concern but at best, on-Forest populations are being held constant.

Resource Susceptibility, Resiliency and Risk

The non-forest community types in the watershed are susceptible to: overgrazing by livestock and wintering big game, slow conversion to conifer, reduced diversity of species and structure, and invasive weed species.

The risk of severe impacts to brush species health is high on winter range. The risk to rangeland from succession to conifer is low because of the long slow process. The risk of reduced species diversity and structure is moderate because some treatments (disturbances) have occurred although they represent less than 10% of the non-forest acreage. The risk of invasive weed infestation is moderately high given the numerous scattered populations known to exist and the opportunity for continued introduction and spread.

The rangeland types are resilient to the periodic disturbances that are necessary to reverse the negative trends listed above. Fire removes the dense brush overstory and kills the encroaching conifer. Grasses and forbs are quick to take advantage of this reduced competition. Brush species slowly return to the sites as long as grazing, both big game and livestock, is not excessive. Rangeland vegetation is less resilient to treatments to control invasive plants because of survival mechanisms like large seed banks in the soil, adaptation to harsh sites, deep root reserves, and effective seed dispersal mechanisms.

Opportunities

Opportunities include; treating additional acres of brush as densities reach 20 to 30% on a significant portion of the watershed, looking at historic rangelands now being dominated by conifer, working with the State Fish and Game Department to recognize the limits of winter range habitat, and continued emphasis on monitoring and treating invasive weeds.

Data gaps and additional information needs

Data gaps include refined mapping of noxious weeds, rangeland vegetation condition, and an inventory of lost acreage to conifer expansion.

4.2 Hydrologic Processes and Water Quality

Opportunities

Home Canyon Creek has been destabilized by the placement of the road in the canyon bottom. This creek will continue to degrade if the situation is not remedied by moving the road.

- Move Home Canyon road (FR149) out of the canyon bottom so that it is out of the floodplain and not constricting the channel.
- Restore the floodplain as a part of the relocation, restoring natural contours and elevations and moving road base to new road location.
- Restore stream channel where channel was moved/altered for original road construction. If stream channel restoration is to be done later, use excess road material to create terraces that can be excavated later to be used in stream restoration.

Snowslide Canyon Creek is degraded due to a variety of causes. More degradation could occur if corrective action is not taken.

- Move and/or reconstruct the lower portion of Snowslide Canyon road (FR111), in the canyon where it constricts the floodplain and or stream channel. Reconstruction would have the goal of reducing road-produced sediment yield and directing yield that is unavoidable to a buffer strip away from the creek.
- Move the cattle guard on the creek upstream or downstream away from the narrow canyon where the required guard bypass unavoidably constricts the floodplain even more.
- Move the pasture fence above the canyon that is currently along the south bank of the creek so that livestock are not concentrated in the riparian area.
- Re-contour floodplain where road is moved out of floodplain.

Restore the historical water balance to the watershed, which has been modified by changes in vegetative patterns. This would increase late summer streamflow that is critical to Salmonid fish survival. Treat by prescribed burning where conifer has invaded aspen, sage has replaced grasses, and conifer has replaced sagebrush and/or grasses so that the overall vegetation community in the watershed returns to a mix of seral stages that is within the historical range of variability.

Investigate ways to alleviate sediment starvation of Montpelier Creek below rearing pond and Reservoir. As a part of this, look at the possibility of reconstructing the rearing pond so that it is a partially or fully off-channel structure, with an armored submerged berm as the interactive channel-pond boundary along the shared channel-pond edge. This would allow larger, more desirable sediment sizes to continue to travel downstream, partly relieving the sediment starvation downstream and increase the time interval between dredging treatments of the pond. Future dredged material would be finer grained and potentially better able to support native vegetation rather than weeds.

Close illegal pioneered roads and motorized trails in riparian areas.

Data gaps and additional information needs

Revisit PFC ratings for FAR rated streams and make trend assessments. Collect more complete, detailed, and locally based information on the water use of various vegetation communities. Collect more detailed information on the historical change in distribution and extent of grass, sagebrush, mountain brush and conifer communities using soils or other data.

Complete survey of soils in existing and suspected previously existing riparian areas along streams and around springs, including mapping of hydric soil extents. This would improve the estimate of the improvement to be expected in riparian extent when vegetation succession is returned to the range of historic variability.

Evaluate performance of culverts in watershed. Calculate correct size and replace culverts where appropriate.

Evaluate current sediment delivery from Whiskey Flat road (FR111) to ephemeral side drainages to Whiskey Creek. Evaluate potential for reduction in sediment delivery from reconstructed road drainage. Reconstruct road drainage to minimize it if benefits warrant.

Home Canyon Opportunity:
Collect detailed stream survey information, estimate hydrologic parameters to be inferred from stream survey. Review older aerial photos collected before road was constructed to evaluate stream geometry from that era.

Snowslide Canyon Creek Opportunity:
Collect detailed stream survey information, estimate hydrologic parameters to be inferred from stream survey. Review older aerial photos collected before road was constructed to evaluate stream geometry from that era.

4.3 Soil Productivity

Opportunities

1. Close and obliterate pioneered, non system roads and trails. Revegetate with appropriate grasses and native shrub (sagebrush, maple, willow or other desired species) to hold the soil in place, and create a physical deterrent to discourage further use.
2. Restrict vehicular camping in riparian areas such as b

Pioneered, illegal trails

ontpelier Reservoir, especially large heavy RV's. (this has been implemented)

3. Treat areas with decadent stands of big sagebrush with prescribed fire to encourage grasses, forbs and other vegetation that would benefit wildlife and help prevent erosion.
4. Develop restoration plans for areas in Home Canyon and Whiskey Flat to mitigate degraded riparian areas from cattle, camping, and off road abuse.
5. Closely monitor new cattle grazing protocols to move cattle sooner in problem riparian areas such as Home Canyon.
6. In severely damaged areas, identified by monitoring, remove or fence cattle out, and let the affected rest.
7. For monitoring purposes, create plots in logged units for different prescriptions and logging intensities, spanning 20 to 30 years, to study the effects of soil disturbances overtime.

Data gaps and additional information needs

- Current ground cover information (percentages of bare ground, grasses and forb composition).
- Accurate information on total pioneered (illegal) ATV trails and other unauthorized motor vehicle roads.
- Updated landslide inventory map
- Long term erosion studies covering key areas in forest (rangelands, forested lands, roaded and recreational areas)
- Major bedding areas for sheep and other localized grazing disturbances caused by sheep or cattle.

4.4 Native Fish Habitat

Interpretation of Trend

Montpelier Creek

Montpelier is an example of disconnect. Water diversion structures, including Montpelier Reservoir, are barriers to upstream-migrating fish. Native fish are being displaced by non-native fish. Without management action, there is a potential of losing native Bonneville cutthroat trout populations in the stream. Some opportunities are listed below.

1. An irrigation dam (15 feet height) occurs near the fire sign at the district boundary. It is a fish barrier. It is operated under a special use permit. When reviewing the permit, consider incorporating fish passage into the terms and conditions. This would connect more than 5 miles of habitat downstream of Montpelier Dam.
2. Waterloo Mine has and continues to leach selenium into Montpelier Creek and the ground water. Current samples still raise concern about effects to fish (10 ppm selenium) (Richard Anderson 2002). Additional samples are recommended to determine effects on fish in lower Montpelier Canyon. In addition, Waterloo Mine is now the city dump, increasing the potential of leaching.


Old Irrigation Dam

3. Inventory and screen water diversions where needed.
4. Inventory dispersed campsites in the riparian area, particularly downstream of the dam. Restrict their growth to minimize impacts to riparian area. Close and/or rehabilitate those that are directly affecting aquatic and riparian habitat quality.
5. Determine if brook trout control is feasible in Montpelier Creek.
6. Encourage IDFG to analyze the Bonneville cutthroat trout genetic samples collected in 2000.
7. Continue distribution surveys of upper Montpelier Creek to determine population trends of Bonneville cutthroat trout and non-native fish.
8. Conduct an R1/R4 physical habitat survey on Montpelier Creek to locate sediment sources and develop restoration plan.
9. Encourage IDFG to conduct creel surveys to determine what impact fishing pressure is having on native cutthroat trout populations. If it is found that the pressure is adversely affecting cutthroat trout populations, address the concern with further public outreach.


Gaging station barrier

10. Work with IDFG to re-establish a native Bonneville cutthroat trout fishery in Montpelier Reservoir.

Snowslide Creek

Non-native fish have nearly displaced native Bonneville cutthroat trout in Snowslide Creek. Cattle impacts to riparian and aquatic habitat have been documented. Bonneville cutthroat trout are nearly extirpated in Snowslide Creek. Risk to the species is high. Some restoration opportunities are listed below.

1. Relocate the fences in upper Snowslide Creek to avoid the current cattle bottlenecking that occurs there. The fence restricts cattle movement away from the stream because it parallels the stream.
2. Provide proper surfacing and drainage on FS Road 801 to decrease sedimentation.

Whiskey Creek

Almost half of the salmonid community in Whiskey Creek consists of non-native brook trout. The risk to native Bonneville cutthroat trout is high. There are opportunities for restoration listed below.

1. Provide proper surfacing and drainage on FS Road 111 and 114 to decrease sedimentation.
2. Consider selectively knocking back the brook trout population in Whiskey Creek to favor Bonneville cutthroat trout in the stream.

Little Beaver Creek

The Little Beaver Creek Bonneville cutthroat trout population appears to be extirpated. Because of that, risk is low. A restoration opportunity is listed below.

1. Consider knocking back the brook trout population in Little Beaver Creek to benefit remaining Bonneville cutthroat trout population.

Home Canyon Creek

Despite what has occurred in the canyon (extensive grazing of the riparian area, road construction parallel to the stream, and water diversions), Home Canyon Creek still has a remnant native trout fisheries. Although, risk to their long term existence is high. Restoration opportunities are listed below.

1. There is an opportunity to restore native fish. If cattle cannot be kept from trampling and overusing vegetation along Left Fork of Home Canyon Creek, exclude cattle from the upper stream. As a result of the project, expect extension of perennial stream upstream. Also, expect seasonal stream segments to flow longer into the year.
2. Obliterate FS Road 149 downstream of the canyon. Construct a trailhead at the end of the road for trail access through the canyon and beyond. Rehabilitate stream channel through canyon.
3. Screen diversions if needed

Wildlife Habitat

Interpretation of Trend

The lack of disturbance to most vegetation types (sagebrush is an exception) has shifted habitat within the watershed towards late successional structure and composition. The consequences of this include a possible decline in some wildlife species and an increase in others, relative to pre-settlement levels. Another consequence is the potential over-use of the remaining early successional acres, especially rangeland types where livestock are part of the equation. However, no species are known to be threatened with extirpation because of these changes. Wolverine and sage grouse have been petitioned to be listed as threatened.

Prescribed fire and wildfire in sage brush types within the watershed have not exceeded the 20% early seral threshold guideline recommended by Connelly.

Linkage habitat is provided for species moving between the Greater Yellowstone area and the Unita Mountains. This is primarily for large carnivores such as the wolf and lynx.

Total acres of riparian habitat have been lost since pre-settlement through diversions, dams, reduction in beaver populations and road building. Beaver populations are not at full potential due to these changes in stream condition and due to loss of food and dam construction materials. Amphibian and migratory bird populations are likely to be below potential due to this loss of riparian acres.

Although the number of open miles of motorized routes has remained relatively steady, the use on those routes has increased and is expected to continue to increase as more people use the Forest for recreation and the popularity of ATV riding increases. The negative impacts to wildlife from this human activity aren't expected to go beyond its current spatial extent as long as open motorized route mileage does not increase and travel restrictions are enforced.

Elk populations are expected to remain stable but deer populations may decline due to changes in habitat, primarily winter range. Summer range will likely remain adequate despite succession of aspen to conifer and some very slow conversion of rangeland types to conifer. The increased elk population occupying higher elevation winter range has concentrated deer on lower elevation winter range which tends to be private land. Human development on these lands continues to reduce this critical habitat.

Opportunities

1. Protect mature sagebrush - The amount of mature sagebrush providing breeding habitat for the Geneva sage grouse leks should be monitored following each fire season to determine compliance with Connelly's recommendations. Controlled wildfire may be allowed until the 20% threshold is approached. New, better, and more extensive data on sagebrush conditions for the entire eleven-mile radius around the Geneva leks may allow for more treatments or may validate a need to exclude treatments for a longer period of time.

2. Increase wetland habitat - Wildlife habitat would increase if the potential vegetative condition of riparian habitat were met. There is an opportunity to increase riparian vegetation for amphibians by fencing the north half of livestock ponds or natural seeps or springs heavily grazed by livestock. (The north half is warmer in the spring.) A water control structure could be placed above the road crossing on the northern arm of the Montpelier Reservoir to provide constant water level to improve and increase wetland habitat.
3. Monitor ATV use on rare plants – Additional Off-road motorized travel restrictions are probably not needed at this time. Enforcement of existing regulations would help alleviate impacts of ATVs on rare plant habitat on the Twincreek formation.
4. Increase early seral aspen, chokecherry, and serviceberry. Good winter habitat has chokecherry, serviceberry, and aspen (D.Meints per. com.). In winter habitat, avoid treatments that will reduce the overall height, canopy cover, or density of key winter shrubs/tree. If treatment is needed to improve the quality of sharp tail winter habitat, limit treatments to no more than 20 percent of the area and allow adequate recovery time (7-10 years) before treating other portions of the winter habitat (Ulliman and others 1998, 15).
5. Monitor snowmobile use - Snowmobile use in wolverine habitat should be monitored to determine if there are undisturbed areas for wolverine denning, specifically, the northern end of the Montpelier watershed.
6) Support CRP – Vegetation on CRP lands contributes to the success of sharp-tailed grouse and elk populations. A reduction would put additional foraging pressure on vegetation at higher elevations until elk populations are reduced. Sharp-tailed grouse would depend on the remaining foothills vegetation for nesting habitat if CRP lands are reduces.
7) Maintain the diversity of forest seral stages / Increase aspen stands – A diversity of seral stages of forest would increase aspen stands. An increase in aspen would support beaver dam construction. Bark beetle mortality is at levels to meet woodpeckers' needs.
8) Follow the Idaho Bird Conservation Plan guidelines: Recommends that each sage grouse area should be provided with at least 25 percent of each major sagebrush community (especially big sagebrush) in an early-seral stage, 25 percent in a mid-seral stage, and 25 percent in a late-seral stage. (For example use <15 %, 15-25%, & >25% canopy cover.) Connelly and others (2000) recommends that, within eleven miles from a lek area, a maximum of 20 percent mountain big sagebrush breeding habitat be treated in a 20-year period. The sagebrush understory should contain a healthy bunchgrass community (bluebunch wheatgrass, Idaho fescue, & S*tipa)*. Adequate ground cover of non-senescent grasses/forbs as cover/forage should be maintained from May 1 to July 15 to provide cover and forage for nesting birds. More than 50 percent of the annual vegetative growth of perennial bunchgrasses should be allowed to persist through next nesting season. The proper use of rest-rotation or deferred-grazing systems will meet these conditions. Springs/seeps in suitable condition will provide for sage grouse water/insect use during chick rearing. Grass height and cover affect sage grouse nest site selection and success. (Connelly and others 2000, 974).

Data gaps and additional information needs

1. Sage brush condition and extent for the entire eleven mile radius around the Geneva leks.
2. Sage grouse use and extent within the watershed.
3. Presence of TES species and/or suitable habitat within the watershed.

4. Carrying capacity for big game on winter range.